Cooperative Extension Work in Agriculture and Home Economics

Extension Service Circular 281 January 1938

SUMMARY OF

RANGE-LIVESTOCK AND RANGE-MANAGEMENT EXTENSION WORK IN THE ELEVEN WESTERN STATES - 1932 TO 1936, INCLUSIVE

PART II. - RANGE MANAGEMENT

Section 1. - Range, Pasture, and Meadow Practices

CALIFORNIA

1934

Mendocino County Agricultural Agent:

Dry Land Pastures and Range Lands: The brush-burning experiment conducted on Burtt Elliott's ranch, Comptche, in cooperation with Professor A. W. Sampson and this office, was expanded during the past year.

1. Acreage: There are 520 acres in the property, five of which were open grass land, the balance being thick brush, which had to be cleared. Approximately 100 acres a year were slashed during successive summers and burned during September and October. The cost of slashing was approximately $7.50 per acre. The reason for chopping the brush was to enable it to be burned clean, leaving no snags through which grazing is made difficult, especially in the denser brush areas.

2. Seeding: The fall is the best time to sow grass following burning because the fall and winter rains give the grass a good start, thereby enabling it to become established before the dry summer. A mixture which has proved satisfactory is 3 pounds red top, 20 pounds perennial rye, 20 pounds orchard grass, 1 pound mustard, and 5 pounds mesquite, per acre. In addition to this mixture, separate seedings of Harding grass have been made under more favorable situations. It has been found that the larger seeded varieties such as rye grass, mustard, and orchard grass should be sown in the ashes, while the smaller ones like red top should be sown after the first rains. No seed bed preparation is necessary in either case.

3. Grazing: The practice of not grazing until the grass goes to seed the first year and not over-grazing thereafter has enabled the cultivated grasses to be maintained. This has been accomplished by small enclosures, thereby enabling the changing of the stock to fresh pastures without over-grazing.

California-1934 (Continued)

Prior to the brush-burning program, the ranch had no carrying capacity, as the dense brush (Blue Blossom) afforded no feed for stock. After clearing and seeding, the same land is running approximately one head of sheep per acre the year round. Since this practice was inaugurated, many springs which had gone dry are now flowing the year round and furnishing the entire water needs of the stock.

C. S. Myszka
R. D. Foote
Ukiah Court House

COLORADO

1934

Costilla County Agricultural Agent:

Range Reseeding: In Costilla County the range and high mountains close to the fertile valleys provide a very good set-up for raising sheep. A large amount of the land in the county is devoted to growing hay and grass to be pastured by sheep flocks. The pastures and meadows are native grasses that were growing wild in the county when the inhabitants moved into it.

The continuous grazing of these meadows by sheep flocks has killed out most of the more palatable grasses until all that is left is the coarse grass and many times poisonous weeds that are not as a rule eaten by the sheep. This condition gradually grew worse until the sheepmen made the request that some work be done on reseeding these pastures.

Several years ago some native grasses were planted at the head of small creeks and in meadows. These grasses have reseeded and are brought down the creeks into the meadows. The amount of these grasses appearing on the ditches and meadows seems to show that this project has been successful.

Mr. Jose Labato, in a report to the Wool Growers, stated that the meadow he had seeded to tame grasses cut 3/4 more tons per acre than the native meadow and the hay was much more palatable than the other hay. Several more sheepmen purchased grass seed in order to start this improvement on their places in 1934.

E. W. Martin
San Luis

1935

Archuleta County Agricultural Agent:

Range Reseeding: At the meeting of the Farm and Home Council Joseph Hersch brought out the fact that many of the ranges were running down and that something should be done to increase the carrying capacity. Mr. Hersch was made chairman of the range improvement project and had a demonstration started with crested wheat grass. Some was sown on fall-plowed ground to be used as irrigated pasture; some on the side of a hill to determine whether or not it could be used for range reseeding; and some in rows to be used for seed production.

Colorado-1935 (Continued)

During eight years of trial plantings made in different parts of the State it has proved to be valuable for reseeding abandoned farmland, pasture for spring and fall grazing, as well as for forage improvement on overgrazed land.

It has withstood drought and exposure to the full force of cold winter winds at Virginia Dale, 7000 feet above sea level, in Larimer County, and Briggsdale, 5000 feet elevation, in Weld County. Stands also have been secured at Calhan, El Paso County, Montrose, Craig, and Fort Collins.

Characteristics which make the crested wheat grass desirable for dryland pastures in Colorado are endurance to low temperatures, resistance to drought, comparative ease of establishment, high palatability and vigorous seed production.

Donald L. McMillen
Pagosa Springs

IDAHO

1935

Animal Husbandry Specialist

Range Management: By general, wide-spread request, work was done with the State cattle committees in the reorganization of the Idaho Cattle and Horse Growers' Association and in properly organizing so as to have competent and qualified representation on the advisory boards for administering the regulated grazing on the public domain lands now going under control. In connection with the cattle problems on the Taylor Grazing Act, four State meetings and three district meetings were held.

The allotment of grazing privileges in Idaho is a serious problem, mostly for the reason that the irrigated and improved farms of the State now produce winter feed for far more livestock than the summer ranges can carry. There are ten times as much carrying capacity of the farms as of the range. The range is now utilized mostly by cattle from mountain and interior ranches, which are far from the railroad and mostly at such an altitude that hay is the only sure crop. When range rights are available, the ranch can be successfully operated with cattle.

In some sections, especially the dairy regions, there is a feeling that the range rights should be divided among all farms. Those who are of this belief maintain that the range rights should be equally divided among all ranches of the State. Instead of having ranches in the interior, where sufficient cattle may be kept to provide a living for a family, they believe that the use of the range should be given over to community herds made up of dairy steers or heifers from the irrigated farms. This is more theoretical than practical. Cattle of dairy breeding have not the range instinct and are not good rustlers. The general tendency of cattle of this breeding is to remain close to the water holes, completely destroying the nearby grass and not utilizing the more remote and inaccessible portions of the range. The result is injurious both to cattle and to the range. Where this system is followed the dairy heifers come back so stunted that their future development into profitable cows is impossible. However, in spite of the fact that the community range herd has been found impractical, some lawyers and professional organizers, among whom are a few theoretical and impractical county agents, formed a strong organization of farmers on the promise of securing

Idaho-1935 (Continued)

the range now being utilized by the permanent old-time outfits. This movement was most untimely and unfortunate. The old strife for grass and range was renewed. Friendship between rangeman and farmer was destroyed. Much necessary extra work had to be done by the range users to offset the promises of men who took it upon themselves to distribute and parcel out the range for the Forest Service and the administration of the Taylor Grazing Act.

Only one section, the western third of Idaho, was made into a permanent grazing district. Preliminary to the election of June 15, a district meeting of 131 cattlemen was held to outline and select proper representatives to the advisory board. Seven out of eight precincts were carried by the range cattlemen, mostly with the aid of farmers who had attended the farm organization meetings held by county agent Hale and knew from their experience that the further reduction of range rights was detrimental to both farm and ranch in destroying the range, removing the market for the surplus hay, and reducing the usual supply of feeder cattle and lambs.

Later elections held were tentative, but the results were much the same, mostly for the reason that range cattlemen received many votes from farmers who do not approve of the plan of distributing the range among all applicants.

E. F. Rinehart
Boise

1936

Idaho County Agricultural Agent:

Range Conservation Program: The Range Conservation Program offered to farmers and stockmen by the Western Division late in 1936, has met with considerable favor in Idaho County. On the closing date of December 1, 293 applications covering 375,000 acres of range land had been filed. The estimated revenue to the stockmen of the county from participation in the 1936 program will reach $25,000. Water development and fence construction are the most common practices employed.

Over 30 range cattlemen and sheepmen attended a conference at the county agent's office Friday, July 10, to discuss the proposed National Range Conservation Program. A. R. Shumway, a representative of the Washington office of the Agricultural Adjustment Administration, outlined the general principles of the proposed plan. The Idaho County stockmen at the meeting recommended that the following seven points be included in the new program:

1. Reseeding of range lands.
2. Improvement of water holes.
3. Rotated grazing of ranges.
4. Weed control on range lands.
5. Rodent control on range lands.
6. Provide for supplemental feeds through the purchase of hay; rental of additional pasture.
7. Voluntary reduction in the number of stock.

During the first two weeks of August a detailed survey of the ranges of Idaho County was made by a crew of men from the University of Idaho. This survey included a classification of a forage on the various ranges of the county and a tabulation of the livestock practices followed by stockmen. A

Idaho-1936 (Continued)

committee was appointed at the meeting Friday to cooperate in making this survey. Those in attendance at the meeting were unanimously in favor of a program such as the one proposed. This program would be applicable to all public and privately owned pasture land in the county outside of the National forest. Benefit payments will be made to those who participate in the proposed program by adopting one of the seven practices recommended.

The final approved Range Conservation program was explained to stockmen of the county at a county-wide meeting held at Grangeville, October 27, with an attendance of 75. Over 100,000 acres of range land were signed up at this first meeting, and as information gradually spread concerning the provisions of the program, additional applications were taken at the county agent's office. It was found necessary to add two members to the County Agricultural Conservation Committee to effectively handle the range conservation program.

This program fits into the operations of the large range cattle and sheep outfits very well and it is hoped that it will be further developed to give some assistance to farmers and stockmen who have small acreages of pasture land in connection with crop land.

W. E. Rawlings
Grangeville

MONTANA

1932

Extension Livestock Specialist:

Range Management: A visit was made to the Gravelly Range to study range management as conducted by the National Forest Service. These high altitude ranges were divided according to natural barriers and vegetation, the higher altitudes being used for sheep grazing and the lower altitudes for cattle grazing. The excellent growth of grass speaks well for the management plan adopted by the Forest Service. The cattle were entered on the lower ranges and gradually moved through the drift fences to the seasonal pastures as the season advanced. The drift fences are constructed along natural dividing lines such as rivers and rough canyons. The range is divided into three general divisions, the earlyspring range being on the lower Ruby Creek, the early summer range follows next, and the late summer is on the highest part of the range. By these divisions and the proper distribution of salt, all the range is utilized with no part being over-grazed. Late in the fall the cattle are allowed to drift back down the creek in reverse order from what they entered. The higher ranges used for the sheep are divided into units which are used alternately during the summer season, thus allowing the section of range that was grazed early one year a chance to reseed the following year before the sheep are turned on. At the time this study was made, the sheep were just getting comfortably located on the range where there was an abundance of grass and weeds for their summer pasture. A striking example

Montana-1932 (Continued)

of this well-managed range could be obtained by a short trip just outside the forest through the unregulated public domain, which had been stripped of all vegetation and its carrying capacity reduced to almost nothing.

I. M. C. Anderson
Montana State College
Bozeman

1936

Fergus County Agricultural Agent:

Crested Wheat Grass: Probably the most important work done in the crop improvement work was giving encouragement to livestock men and farmers in seeding crested wheat grass for hay and pasture. The experiences of H. H. Haight of Suffolk; Central Montana Farm Agency, Glen Morton, Manager; and the Moccasin Experiment Station were used to good advantage in promoting the seeding of crested wheat grass. The Moccasin Station's three-year average, 1934-35-36, on pounds of beef produced, shows crested wheat grass 55.7 pounds per acre, native grass 24.5 pounds; on pasture days per acre, crested wheat, 26.6 days, native grass 10.9 days. These results have been borne out by the results obtained by Mr. Haight and Mr. Morton. Although they do not have actual figures to support their conclusions, their livestock have been able to make satisfactory gains by staying on the crested wheat two to three times more pasture days than on the native grass.

The first seeding of crested wheat grass in Fergus County was made by H. H. Haight of Suffolk. He now has well over 600 acres which he uses for hay and pasture. With a normal survival of the 1935 and 1936 seedings, the total crested wheat acreage of the county should be near 10,000 acres in 1937. It is likely, however, that the acreage will be materially reduced by grasshoppers. The grasshoppers, together with drought, struck the new seedings when the plants were about three inches high.

With ordinary conditions for seeding, crested wheat grass could easily increase the carrying capacity of the range land of Fergus County, by 50 percent. The acreage to be reseeded is mostly abandoned wheat land.

H. P. Stuckey
Lewiston

OREGON

1936

Agronomy Specialist

Pasture: Crested Wheat Grass: All of the nurseries on bunch grass range-land and abandoned wheat land in eastern Oregon have shown clearly that crested wheat is the outstanding grass for dry-land conditions for the following reasons:

1. It goes dormant in the seedling stage if moisture is not available, thus enabling one to get a stand if it gets through the ground. Other grasses die before becoming established.

Oregon-1936 (Continued)

2. This same dormancy habit carries into the mature stage, enabling the grass to survive the rainless summer months of eastern Oregon.

3. It starts earlier both spring and fall than any other grass.

4. It sets seed abundantly, making it easy for a farmer to grow his own seed.

5. It is one of the most palatable of the dry-land grasses.

6. The root growth is more extensive than that of other dry-land grasses, making it impossible for wild bromes, weeds, and so forth, to become established in good stands of crested wheat.

7. It withstands severe grazing better than most grasses.

8. Apparently it is cold immune so far as ordinary temperatures are concerned. It has withstood 57° below zero, with no snow, and no sign of killing.

The Soil Conservation Service has given considerable impetus to the crested wheat grass project which has been going on in this State for six years. The specialist mentions crested wheat grass at stockmen's meetings and at nearl all meetings in eastern Oregon. It is called to the attention of farmers through news stories, radio talks, winter meetings, meetings at nurseries, field tours, and so forth. The lack of seed and high price of seed have held up the project, but even so it is advancing.

The Agricultural Conservation Program of the AAA has advanced the crested wheat grass project materially. Seedings have been large in the Columbia River Basin, especially in Gilliam County, where 10,000 acres were planted in the fall of 1936, followed closely by Morrow County with 7,000. The lack of seed hindered the project, but fortunately the need had been anticipated, and the State produced 89,433 pounds of seed.

Range Grasses: For the past several years the Specialist has adopted as a special program the management of dry-land grasses. A set of slides has been developed covering a talk on this subject. These slides were used this year at the annual meeting of the Morrow County Stockmen's Association and the joint meeting of the Gilliam-Wheeler County Stockmen's Association. In addition, a talk on this subject was given at the annual meeting of the Cattle and Horse Raisers' Association. The subject was also discussed on the radio over NBC, as a part of the Western Farm and Home Hour. Articles were written for the State Wool Growers' Association magazine, "Oregon Lambs and Wool", and for the official publication of the Cattle and Horse Raisers' Association paper.

It is planned to present a good deal of this same material at a series of meetings to be held in all of the eastern Oregon counties during the coming winter. These are forage resource and feeders meetings, and will attract considerable attention. Mr. H. A. Lindgren, Livestock Specialist, is in charge of these meetings. The set of slides has been revised and brought up to date.

Much of the same material has also been worked into a crested wheat grass bulletin, which has been completed and will be distributed early in 1937.

In presenting this grass management material, every case is seized upon to tell the story of grass and how it can be maintained. It is the specialist's idea that farmers naturally want to keep their grass, and if they understand the principles of its growth and why it is killed out and under what conditions it survives, that will be the first step toward

Oregon-1936 (Continued)

management of the ranges so as to maintain grass hereafter. We believe this to be one of the most important pieces of work under way.

E. R. Jackman
Lawrence Jenkins
State Agricultural College
Corvallis

WASHINGTON

1936

Animal Husbandry Specialist:

Sheep Range Land in Western Washington: Many inquiries are received each year as to the advisability of ranging sheep and/or cattle on the cut-over lands of western Washington or Oregon. For this reason the extension animal husbandman has tried to keep in touch with the results rangemen are getting from running ewes and lambs on this cut-over land.

Some time was spent in Lewis and Cowlitz counties observing land that had been seeded since being cut over. Some of this land was very good and had a fair stand of grass and weeds, and looked as if it would make satisfactory pasture. One band of sheep, March lambs, that had been brought from east of the mountains, were marketed during the first 10 days of September. These lambs weighed about 71 or 72 pounds. These lambs and ewes were on good pasture and one would have expected that the lambs would have weighed at least 85 pounds. The weights were very disappointing and not too encouraging of pasturing sheep on the west side, if you are depending upon marketing grass-fat lambs.

Similar observations were made down in Columbia County, Oregon. Lambs marketed about the 30th of August, off the range, lambs that were born in March, weighed 69 pounds. Lambs from the same flock on the same range in 1935, weighed considerably heavier and the feed did not seem so good in 1935. That was not only my opinion but it was also the opinion of the herders who were caring for the sheep.

Range Livestock Program: The range livestock conservation meeting in Spokane was generally well attended. Suggestions from the ranchers as to whether the program should be put into effect or not, and if so, what practices would constitute range improvement, were made rather freely. Most ranchers were pleased and surprised to know that such practical things as spring development, drift fences, and deferred grazing would be considered range-building practices. As a result of the meeting the following suggestions for practices upon which payments would be made were as follows:

1. Deferred grazing.
2. Rotation grazing.
3. Natural revegetation.
4. Artificial reseeding.
5. Water development.
   a. Wells
   b. Reservoirs
   c. Springs
   d. Pipe lines
6. Rodent control; predatory animal control.
7. Fencing.
8. Contouring.
9. Water spreading.
10. Trail development.
11. Poisonous and noxious weed control.
12. Windbreaks.
13. Insect Control.
14. Fire guards.
15. Loading and grading corral.

Washington-1936 (Continued)

It was the feeling of most ranchers present that if the program could be gotten under way immediately, many would be willing to take advantage of the program in the fall of 1936.

The extension animal husbandman gave assistance to those counties desiring help in explaining and discussing the range livestock program. By the end of the season 574 range examinations had been completed, covering 1,415,715 acres of range land, involving maximum benefit payment of $80,000.

Con S. Maddox
State College of Washington
Pullman

WYOMING

1934

Carbon County Agricultural Agent:

Meadow Improvement: The Meadow Improvement Project is the major project in Carbon County. It is a basic livestock project, as well as a crops project. It reaches the very foundation of Carbon County agriculture because it is improving and increasing the production of winter feed. The meadows reported are only those on which definite and complete information is on file in the County Extension Office.

The continued demonstrations in alfalfa cultivation have proven decisively to the people of this county the value of this work, because it has shown that the weed problem can be controlled; that greater yields can be obtained; that finer alfalfa can be produced; and that better use can be obtained from the water applied. This latter is of particular importance in years of water shortage, such as the present year.

With native meadow cultivation, the problem of the particular type of harrow best adapted to this use has been one of the problems commanding considerable attention. It is rather definitely demonstrated now that an old-fashiones A-type, spike-tooth harrow is the better type, and all ranchers are turning to this type of harrow.

Louis Schilt of Saratoga, who by cultivation increased the production of hay on 90 acres, from 60 tons to 127 tons during the years 1931 to 1933, inclusive, in 1934 cultivated only 50 acres of this land. This was a ranch which was very short of water this year, and Mr. Schilt states in his report that there was a 25 percent difference in production between the cultivated and the uncultivated land. Mr. Schilt furthermore states that the quality of the hay was superior and that the irrigation water spread and seeped into the soil better.

1935

James McIntosh of Split Rock, who after considerable thought and consideration, met a peculiar problem in a very definite way, finds much of his land extremely rough and covered with old brush hummock, where in the process of meadow making the brush was simply killed out by flooding, making a meadow floor too rough for the practical use of an ordinary harrow. Mr. McIntosh constructed a special cutting harrow of angle-iron, with adjustable teeth to

Wyoming-1935 (Continued)

cut these meadows down. Ten acres were treated with this harrow this year with the result that a sufficient smoothing was accomplished that cultivation with an A-type harrow is practical. He has laid the foundations for a complete job of meadow renovation starting next year.

Paul Pearson of Saratoga reports that two years' cultivation on 100 acres of native meadow has resulted in doubling the stand of grass. In addition, the floor of the meadow is smoother and weeds have been put under control. This was accomplished on a 35-year-old meadow.

John J. McElroy
Rawlins

1936

Platte County Agricultural Agent:

Range Management: A Committee on Range Conservation was appointed in midsummer to meet with a group of similar committees of the State, on the range program. The following is a report of this committee and the recommendations whidh they made to the State group, many of which have been carried out in the range program.

1. That control work on rodents and insects (grasshoppers and Mormon crickets) be increased to protect the range grass.

2. We urge that some plan be worked out to have the submarginal lands division purchase such lands in smaller blocks, such as one-half sections, or a few sections, and that these be leased for long periods of time to stockmen adjoining this area and be administered by county and local committees.

3. Recommended that the stock-grower be given an opportunity to enter into a range management program whereby the range would be improved by some grazing improvement plan as deferred grazing, limited grazing, certain seasons, and so forth, and by limiting numbers of stock to a reasonable carrying capacity of the range (capacity to be determined by local men), and that a payment be made to cooperators who comply, sufficient to repay them for holding numbers to their allotment for the period agreed upon.

4. Expand soil conservation work to include areas where water run-off is heavy, to store water for livestock and deplete or dissipate water on grass lands nearby, or if growers construct such dikes or dams with their own funds under supervision of soil conservation engineers that they be given payments nearly equal the cost of such construction.

That the program if worked out along the above suggestions be administered by local and county committees elected by the cooperators.

G. W. Boyd
Wheatland

Section 2.--Miscellaneous Range Activities

Conservation

ARIZONA

1932

Agronomy Specialist

Terracing: Soil erosion, both sheet and gullying, is common on both range and farm lands in Arizona.

Due to contacts by the county agents and articles and circulars from the county agents' offices and the main Extension office, three demonstration terraces were built this past year in Yavapai County, two in Coconini County, and one in Navajo County. These terraces are to be watched closely for results and have already created considerable interest within the counties in which they are constructed.

Another phase of terracing which is relatively new in the United States is the range terrace, which is being tried in Pima County. In 1931, an area of desert mesa land was terraced, which practice has proven very successful in holding top soil conserving moisture, and stimulating plant growth. County Agent C. B. Brown reports that on June 29, 1931, there was a rainfall of 0.84 of an inch. Soil on the sheet eroded area was wet to the depth of only 1 inch, while on an area only two rods away having vegetation and top soil it was wet to a depth of 6 inches. On the same areas there occurred on November 22, 1931, 1.68 inches of rainfall. Determinations made on the 24th showed that on the eroded area there had been only a four-inch penetration of moisture, while on the vegetation area there had been a penetration of one and one-half feet.

The work now started in Arizona should gather momentum and be of great immediate value to the farmers and rangemen of the State, as well as of immeasurable future value to all the people of the State.

Irrigation: Throughout Arizona there are hundreds of thousands of acres of rich level mesa land which, through the use of flood waters, could be utilized in the production of supplementary feed stuff, such as corn, hegari, sweet clover, and Johnson grass for range animals.

Mr. C. L. Phillips, located some 15 miles west of Tucson, produced a good crop of corn, hegari, melons and small grains with less than four inches of rainfall during the season and two irrigations from flood water. The most common and practical use of this method of flood water utilization, however, is in the production of pasture. Johnson grass has proved an excellent pasture crop under southern Arizona conditions.

The irrigation of heavy soils and slick spots has been a serious problem for a number of years. The solution of the problem seems to be one of irrigation on a dead level with the addition of organic matter in the form of barnyard or green manures.

Arizona-1932 (Continued)

A number of demonstrations conducted the past two years in Pima, Pinal and Maricopa counties where organic matter was incorporated and irrigation on a dead level was practised have shown good results.

H. N. Watenpaugh
College of Agriculture
University of Arizona
Tucson

1934

Pima County Agricultural Agent:

Range Erosion: About a year ago the writer was talking to one of the cattlemen in Pima County, Arizona, through whose holdings passes the Brawley Wash in the Altar Valley, about erosion problems and the possibility of securing more floodwater for supplementary feed production. After a moment's reflection this old pioneer cattleman replied: "No, Brown, I have spent hundreds of dollars fighting a losing battle, and only God Almighty can handle the situation now."

At first floodwater concentrated in an old road, or a cow path, and formed a small ditch which seemed to hardly attract attention.

Then one day we noticed that a recent heavy flood had really gone to work in earnest to dig out a good channel for itself. We decided to see what could be done about the matter and went after the problem in a half-hearted manner by putting in some brush and a few barricades. The next flood, however, just washed around these obstructions making the channel wider and only making matters worse.

About that time we realized that the concentration of flood water was increasing and that the channel was rapidly lengthening.

Then the arch enemy of fertile range land--concentrated floodwater--was given artificial assistance. The increased use of the auto had made necessary better roads which would be passable under all conditions. Accordingly, the county, in one instance, selected a right-of-way across the valley some miles up from the ranch of our friend who had resigned his fate to the Creator of all things. In 1920 the county started construction of a long grade with a hundred-foot bridge in the center and located in the very trough of the valley.

The stage was then all set and havoc began. Great quantities of floodwater which had formerly spread out over the whole valley and moved slowly were now gathered into a raging torrent and the destruction of as fertile a stretch of land as ever graced a cow ranch was on its way. Nature had been outraged by the thoughtless and careless hand of man and it was out for revenge.

Today the job is well along to completion, and there stands as a monument to all who had a part in producing it, a wash thirty miles or more in length, ten to forty feet deep, and from one hundred feet to a quarter of a mile in width. Hundreds of side washes have taken up their part and so the play goes on.

The fundamental principle underlying all erosion-control work is deconcentration of destructive floodwater from narrow drainage courses, with emphasis on the importance of eliminating erosive concentration of flood water by highway systems or other artificial construction. Narrow culverts, bridges,

Arizona-1934 (Continued)

concentration dykes and ditches will, if spreading works are not used in connection with them, undo in time a large part of all that one can accomplish by good range management.

In the employment of artificial measures on a badly eroded area of range land corrective work should usually start at the source rather than in main channels. However, if destructive concentration can be economically effected in main channels, we would advise that such work be done simultaneously. The work is divided as follows:

Small arroyos and washes (tributaries).

1. Brush.
2. Loose rock dams.
3. Rock mattress dams.
4. Woven wire stockades either with or without rock.
5. Diversion dykes.

Main arroyos and washes (where erosion has not progressed).

1. Diversion and spreading.

Where there are stretches of fairly level or smooth range bordering drainage courses on their way to the valley proper, divert the floodwater at suitable intervals and irrigate the native forage plants. These wide ditches usually should be started from the natural stream level and run on a grade not to exceed five-tenths of a foot to the hundred, and with low brush or woven wire dams at intervals to force part of the head of water through the dyke bordering the lower side of the ditch. In this way much flood water is made to penetrate into soil and produce a greatly increased crop of grass.

Where stock water is not easily obtained from wells, suitable locations can be selected near main arroyos and a represso or charco constructed in which a large amount of water can be put to beneficial use.

The method of preventing erosion through use of range contour dykes is not soapplicable to Arizona. It is better adapted to ranges which are relatively smooth.

In Arizona there are numerous valleys which are concentration points for flood waters which have traversed the slopes (sometimes miles in extent), finally culminating in the crests of mountain ranges.

When erosion in such valleys becomes well started there seems to be only one practical way of repairingthe damage and that is a slow and very expensive one. This method involves the construction of low, woven wire check dams, two or three feet high, built at proper intervals in the stream bed. When the channel floor has been built up to the level of the check dams, a new set is put in and the building-up process repeated.

A series of heavy woven-wire, rock stockade deflectors will help straighten drainage channels and reduce erosion in bends. Use a double row of iron pipe posts well set in the stream bed and fasten woven wire set below the stream bed, level to each row of posts; then fill in, preferably with rock. After the building process is well begun in these beds, this work can be further aided by the planting of trees or some adapted grass.

C. B. Brown
227 W. Congress Street
Tucson

MONTANA

1936

Phillips County Agricultural Agent:

Land Utilization: Through the cooperation of the Taylor Grazing district, the two State grazing associations, the Resettlement Administration and the Extension agent's office, 475 farmers and stockmen have been given range assignments, 133 stock water reservoirs have been started and 68 completed, two dipping vats and corrals constructed, and 48 flood irrigation systems involving 4,185 acres planned and surveyed.

The definite assignment of range land is the result of 12 years of educational and organization work. Operators are now beginning to exercise complete control of their grazing lands and are given the needed incentive to improve them. With the vast amount of open range in the past, this has been almost impossible. Deferred and rotation grazing may now be practised with a reasonable certainty that the operator will not be grazed off by some outsider or local free lance. While the Extension Agent has refrained from taking any part in the actual range assignments, his office has cooperated in an advisory and educational way.

Control of water holes generally means control of adjoining range land. In the past this has been confined largely to natural water courses and has meant an uneven distribution of grazing, with the result that range contiguous to the water holes was overgrazed and other large areas left unused. To help correct this situation the Resettlement Administration has undertaken a reservoir building program with the ultimate goal of having a good supply of water every two miles on the range.

The last seven years have taught the stockmen that livestock security means bigger feed reserves. In the dryland areas this can be accomplished by using run-off water for flood irrigation. Since 1923 a total of 217 flood irrigation systems involving 20,635 acres have been changed from sun-baked sagebrush flats to feed-producing land.

Another bad drought has still further changed the farming pattern of the county. More land is being abandoned, either voluntarily or through land purchases by the Government. Ranchers are rounding out their units by securing control of these abandoned farms. The tendency is toward fewer and larger units.

H. M. Oefstos
Malta

NEW MEXICO

1933

Harding County Agricultural Agent

Water Conservation: T. J. Heimann sought the agent's advice as to how to take advantage of the terrain and rainfall so that he could develop water in each of his pastures. The agent went over Mr. Heimann's ranch with him and selected three dam projects. On the west side of his range, a dam

site was located in a draw where, with very little work, a large reservoir of water could be produced, and the spillway made to run over the hill into a flood plain and would flood several hundred acres of grass land and could then be recaptured by a ditch and carried into another dam which we located in the southwest corner of his place. These two dams were located two miles apart and would provide a watering place for the cattle without their having to travel over a mile and a half from any place in the west pasture. On the eastern side of his place he has two good wells fairly close together; but he has quite a tract of land upon a mesa which provides plenty of good grass but no water. We selected a dam site in the head of a draw and from this ran a ditch in each direction around the mesa, which will catch most of the run-off and carry it into this dam. When these projects are completed, Mr. Heimann should have excellent watering places over his entire ranch.

James G. Wayne
Mosquero

Grant County Agricultural Agent:

Erosion Control: During March a meeting was held at the city hall relative both to the Gila watershed and the limit to which cattlemen on this watershed might be cut within the next few years in order to bring back the range to the point that retrogression would not proceed as rapidly as it has for the past generation. This meeting was attended by 100 cattlemen of Grant County. The point that was emphasized was that either cooperation could be given the Federal Government in protection of the range through the reduction of livestock in the area or the reduction in livestock numbers would be even more rapid and permanent by the continuation of a short-sighted policy of over-grazing year after year. The meeting finally went on record as being in favor of having the Gila watershed placed under a range conservancy plan and thus secure aid in the control of erosion that had already taken place. Due to this meeting we now have two C. C. C. camps in Grant County for the control of washing of soil and the storage of water. So far these camps have functioned much better than most of the camps that have devoted all their time to the building of dams, as the cattlemen are cooperating with them since it furnishes them an ideal method of securing better water distribution over their ranges.

The work has apparently not been started too soon as the Gila River went dry in many places during the summer, something that had never happened even during the most severe droughts. Wells also through this area went dry, and even where cattlemen had almost ample grass they were forced to sell to the Government because of shortage of water. Because of the steep slopes and mountainous type of country in this county erosion is of particular importance here and is making its presence known by the large amount of weeds that are supplanting native grasses on the range. The appropriation for the upper Gila Valley is for $250,000.

Stuart Stirling
Silver City

OREGON

1936

Morrow County Agricultural Agent:

Wind Erosion on Range Land: In the North end of Morrow County there is an area about 35 miles long and 15 miles wide which has been devoted entirely to grazing. Stockmen who have been in this county since the early days say that this section was originally a solid stand of bunch grass with very little evidence of sagebrush. In the early days this section was used mostly for cattle and horse range. Gradually the horses were eliminated and sheep replaced the cattle. This whole section of country fits in well as early sheep range. Over-grazing has driven out most of the bunch grass which has been replaced by less productive annual grasses, sagebrush, and weeds.

There is probably little doubt that with proper management this whole area, comprising roughly 240,000 acres of land, could be brought back to a point where it would furnish feed for many more sheep than now graze on it, or would furnish much better feed for the same number. Water developments are few and far between, and it has been necessary to trail sheep considerable distances to water. The result is that the range for some distance around the water holes is seriously impoverished. Over most of this area, it would be possible to get water at a depth of 100 feet or less.

The gradual and continual deterioration of this range has resulted in a situation which has become so acute that an urgent demand has been made among the legitimate users of that range for some type of range control that would not only stop the deterioration of the range but would aid them in bringing it back to something like its former condition.

As a response to this demand, a meeting was held on the 29th of July in the county agent's office for the purpose of considering ways and means for controlling grazing in this area. P. M. Brandt, Head of the Bureau of Animal Industries at Oregon State Agricultural College, and Marvin Klemme, Regional Grazier at Burns, were present to advise us in our discussion. As a result of this meeting a petition was prepared and signed by all of the men present. This petition was addressed to F. R. Carpenter, Head of the Grazing Service, Department of Interior.

After considerable correspondence and delays of one sort or another, the Department of Interior finally set November 6 as the date for the meeting of all the users of range in the territory included in the petition.

Mr. Galt of the Grazing Service at Burns, discussed the operation of grazing associations in the existing grazing districts administered through that office. The group went on record unanimously as favoring the organization of a grazing district.

Nearly all of the users in the projected Grazing District are heartily in favor of the regulation of the use of the range to the end that not only will this land be not further impoverished, but that its carrying capacity may be improved. The writer feels that the way has been paved for real progress in range improvement.

Joseph Bellanger
Heppner

Wyoming (Continued)

1936

Campbell County Agricultural Agent:

Water Conservation: The Soil Conservation Service advanced funds to be used in the construction of stockwater reservoirs on privately owned land. A cooperative agreement was signed with the owner furnishing the following: All materials used in the construction of the dam, stock water for teams used in the construction of the dam, all equipment needed for the construction work, filing fee of $2.00 to the State Engineer, fence the fill of the dam stock tight, furnish one four-horse team during the construction of the dam, and to maintain the dam for a period of five years. The Soil Conservation Service paid the wages of the crew.

The county agricultural agent took applications from ranchers who needed stockwater reservoirs, selected suitable sites, arranged for the crew, kept the payroll, drew up cooperative agreement contracts, and furnished description of the cooperators' holdings and location of the dam.

In selecting the sites from among the 250 applications, the following points were kept in mind:

(1). Location. A central point in relation to the location of the drought-stricken farmers who would work on the dam was sought.

(2). Amount of Storage Space. The amount of water that could be stored in relation to the amount of dirt required in the fill of the dam was considered.

(3). Type of spillway. The permanency of a properly constructed dam depends upon the permanency of its spillway. Natural sod spillways that would spread the water over adjacent flats were selected wherever possible.

(4). Drainage. The drainage was inspected to determine if there would normally be sufficient run-off to fill the reservoir.

(5). Need of stockwater. The reservoirs were located only in dry areas where stock had to travel from one to three miles to water.

(6). Silt. Dams were not located on drainage that displayed evidence that the run-off carried a great amount of sediment which would quickly fill the storage basin.

(7). Soil texture. Dams were located only where the soil had the property to puddle readily and prevent seepage.

All dams were surveyed and staked to meet the specifications set up by the State engineer of the State of Wyoming. The Soil Conservation Service attempted to furnish engineers to survey dams as needed. However, the territory was extremely large and the number of engineers available could not cover it adequately. In order to keep the crews at work, the agricultural agent secured the cooperation of R. L. Streeter, Campbell County Surveyor, who willingly gave his time to expedite this program. A total of 28 dams were constructed in Campbell County under this project. Mr. Streeter surveyed and staked 13 of these.

This project furnished work to 160 drought-stricken farmers and their teams for a period of three months--August, September, and October. The total payroll was approximately $30,000. In addition, 28 large stockwater reservoirs were constructed in areas where they are badly needed.

F. E. Dominy
Gillette

Noxious Weeds

ARIZONA

1932

Navajo County Agricultural Agent:

Weeds: In the spring and forepart of the summer, the loco weed on the open range over large areas causes rather serious losses of mature cattle, young stock, and calves, through abortion. In 1931, Professor A. B. Ballantyne, Assistant Extension Director, University of Arizona, and the writer began a study of the loco situation with respect to animal losses and control measures. A number of cattle outfits were interviewed. According to their reports the annual losses of mature cattle in bad loco seasons is about 26% and 57% of the calf crop, with reduction of calf crop in the years following bad loco seasons. Cattle that eat loco freely readily become locoed.

The loco plant is a winter annual beginning its growth in spring, summer, or fall of a wet favorable season and over-wintering as a green plant beginning rapid growth with the first mild days of late winter and early spring, thus making the only green plants on the general cattle range of Northern Arizona in late winter and early spring.

The fall of 1931 was favorable for a loco test. The Extension Service, under the supervision of Assistant Director Ballantyne, rented a pasture of about a section adjacent to the Holbrook-Snowflake highway wherein there was an abundance of well distributed loco plant and plenty of forage and water for cattle. This large pasture was divided into three smaller ones as nearly uniform in stand of loco and available forage as might be. Flake Brothers, of Snowflake, furnished twenty-four head of cattle with which to make the test. One group was given steamed bone-meal in addition to the native forage, water and salt supply; a second had cottonseed cake; a third had no special consideration used as a check.

The results showed that those eating cottonseed cake fared better than either of the others, and the check group came out second best. Cattle on the open range showed effects of loco approximately three weeks earlier than did those in the test, which may have been due to the fact that the test cattle had salt and water easily available.

C. R. Fillerup
Snowflake

IDAHO

1932

Agronomy Specialist:

Weed Control: As has been the custom in previous years, a careful survey of the work done in 1931 was made before recommendations for 1932 were sent out.

Idaho-1932 (Continued)

The survey of the work done in 1931 consisted of a trip into all of the counties doing weed work and going over the experimental plots which this department put on in 1931, as well as commercial work done by the counties. This included careful checks as to time of application, amounts of chemical used, and so forth. In each county the group usually consisted of the county extension agent, county weed supervisor (if one was employed), county commissioners, and any interested farmers.

Readings of the surface kill were made on each treated area. This was followed by digging into the ground to ascertain the depth of kill and to find out if any roots remained alive. Then there usually followed an informal discussion concerning the results, taking into consideration the causes contributing to the kill or lack of kill.

At the close of this tour all the results were summarized and from this summary, the 1932 recommendations were drawn.

Sodium chlorate, when properly applied, was found to give the most satisfactory results. Kills running from 50% to 100% were found, but in general it was found that where sodium chlorate was used in a water solution, using one pound per gallon of water and the infested area thoroughly sprayed, fairly uniform and satisfactory results might be expected. Different species of weeds require different amounts of chemical and equivalent applications on the same species do not always give the same results, even when applied at the same time. Contrary to previous recommendations, it was found that spraying the top growth of weeds made very little difference with the results. On many experimental plots excellent results were obtained from spraying with sodium chlorate after all of the top growth had been removed. This has given rise to the belief that most summer applications were largely for the killing of the top growth to prevent seeding, and that the actual control comes from applications made during the late fall.

Calcium chlorate, sold under the trade name of "Atlacide", is used in several counties. This consists of a mixture of sodium chlorate and calcium chloride. The hygroscopic properties of this mixture are claimed to reduce the fire hazard. The results obtained from the use of Atlacide varied considerably, but in general the results were somewhat less satisfactory than obtained with sodium chlorate.

Carbon bisulphide was used quite extensively in Twin Falls County but here again there was considerable variation in the results, depending upon the moisture conditions of the soil at the time of application. When applied under the proper conditions of moisture, this chemical is almost 100% effective, but if the soil is dry, it is practically ineffective. The cost of material and the cost of application have combined to limit the use of carbon bisulphide to areas of high priced land where the crop returns would justify the expense.

Clean cultivation was tried more extensively last year than in several years previous, particularly in Jerome, Minidoka, Madison, Jefferson, and Franklin Counties. Under the present conditions, when prices of farm products are low and labor is relatively cheap, clean cultivation offers the most economical method of weed control. In numerous cases, 100% control has been effected through one year's clean cultivation. With present costs this can be done for less than $25 per acre. This is less than half the cost of chlorates and not over one-fourth the cost of carbon bisulphide. In addition, the

Idaho-1932 (Continued)

physical condition of the soil is improved at the end of the cultivation period, while with chlorates, the detrimental effects may be felt for a year or so following application.

H. L. Spence, Jr.
L. V. Benjamin
Boise

OREGON

1935

Curry County Agricultural Agent:

Weed Control: The use of sodium chlorate and carbon di-sulphide as a weed killer has generally proved to be unreliable and expensive. On the sheep ranges various kinds of brush are considered the greatest hazard. On some of the bottom lands Canadian thistles and evergreen blackberries have been quite a problem. Confining goats or hogs on these various areas has proved more successful than any other practice. Robert Williams, Brookings, confined 154 goats on 80 acres of dense brush from the first of March until the middle of September, at which time a person could ride a horse almost anywhere within the enclosure and an excellent seed bed was prepared. This was seeded before the first fall rains and Mr. Williams reports an excellent stand of grass.

R. M. Knox
Gold Beach

UTAH

1936

Agronomy Specialist:

State-Wide W. P. A. Weed Project. The State Correlation Committee, consisting of Director of Extension Service, Director of Experiment Station, State Commissioner of Agriculture, State Farm Bureau president, and Agronomist at the College, waited upon the authorities of the W. P. A. forces in the State, early in February. The result was the setting up of a State-wide weed project. Director Peterson asked me to represent the Extension Service in handling this project.

George L. Hobsen, a member of the State Board of Agriculture, was appointed State Weed Supervisor. Each county was organized with a weed committee, consisting of a county commissioner, county agent, agricultural inspector, county farm bureau president, and the district W. P. A. supervisor. The county weed supervisor divided his W. P. A. workers into crews of from 12 to 15 men, with a foreman over each group. Each crew was given an area of sufficient magnitude so that the whole area could be gone over once every ten days to two weeks during the growing season.

Solicitors were appointed for each crew to make contact with the owners of land where weeds were located. The business of these solicitors was to get the cooperation and permission of the land owners to work the land. All

Utah-1936 (Continued)

arrangements were made by these solicitors so that everything was always in readiness when the workers arrived and no time was lost. The arrangement was that the owners of the land upon which the weeds were growing plow the weed patches, and in every possible way get the land ready so that the W. P. A. workers could do their work most effectively and with the least possible waste of time. Following is Mr. Hobsen's report of the work done in the State on this project.

Final Report of W.P.A. Weed Eradication Project
as Compiled For The Season 1936

The project was State-wide, covering 21 counties, having originated by the efforts of a correlation group, namely, State Board of Agriculture, Extension Division of the Agricultural College, Utah State Farm Bureau, and Works Progress Administration. In the original project the sum of $910,000.00 was requested and granted by the Federal Government, of which $533,818.67 had been expended in the season of 1936.

There has been employed each period 1,265 men, covering all branches of work such as relief labor, relief supervision, non-relief supervision, teamster, truckmen and solicitors.

The total outlay by the Works Progress Administration has been $485,084.58, with contributions of $48,735.00, making a grand total of $533,819.58. Hand cultivation was performed on cultivated land, streams, canals and ditches, roadways, fences, railroad rights-of-way, and so forth. We have covered 19,184.07 acres, or an average per period of 1,370.29 acres, at a cost per period cultivation of $18.69, or total cost for the season of $261.61 per acre.

Team Cultivation. Under team cultivation we have worked 38,833.86 acres at a total cost of $102,440.48, or a period cultivation of 2,773.84 acres, at a period cost of $2.64, or season cost per acre of $36.96.

Mowed. There has been mowed in all districts a total of 951.69 acres at a season cost of $2.94 per acre, or a total cost of $2,801.17.

Spraying: There were 1,812.93 acres sprayed for the season, at a cost per acre of $8.63. This cost is low, for the reason that some of the southern counties, where poison milkweed is found (and which does not grow in patches as other weeds do), covers a large acreage, with just single plants here and there. There was no other means of calculating the acreage so the block of land covered was counted and found its way into this spray column. The Salt Lake County written report shows spray costs on a highly infested area at $77.27, which cost would be a good estimate where it was done on solid acreage and under common circumstances.

Burned: The process of burning has mainly to do with clearing and burning green and dry vegetation, lending largely to the prevention and spread of seed, and has no particular advantage so far as eradication of plants is concerned. Flame guns mainly were used on steep banks, ditch banks and in wooded or willow-covered sections. Some burning, however, has been done in clearing ground so cultivation with blade weeders could be possible. Covered under this project are 2,487.89 acres, at a total cost of $7,141.46, or an average cost per acre of $2.88. This acre cost appears low, but in consideration of where fields were raked by team, and vegetation piled and burned, it would not show an excessive cost per acre.

Utah-1936 (Continued)

Plowed Land: There were 6,387.46 acres plowed, some land as many as three plowings in the season, made possible by rains and floods which packed land so the blade weeders would not cut the required depth. The total cost for all plowing in this project is $41,828.09, and a cost per acre of $6.54.

Other Costs: There were 232.79 acres covered by the season's work, not called for under heads of the W.P.A. period report, at a cost of $5,494.63. Most of this acreage is covered by three items: Salted, removal of brush, and weed survey work. In some counties weed survey could not be continued in the early part of the season because of lack of available men, but was continued in the latter part of the season and charted to Other Costs, which should have been absorbed in acreage costs. All of this cost is not chargeable to the acreage.

These figures cover 69,890.69 acre cultivation at a cost of $533,818.67, or a period cost, including team and handwork, of $7.64 per acre cultivation.

The noxious weeds worked by the project are, in the order of their ability to resist eradication: white-top, wild morning glory, Russian knapweed, Canada thistle, puncture vine and poison milkweed. Some work also has been done cleaning livestock trails of sand and cocklebur (which, under the general cultural method have not been worked), in which case burs were pulled by hand and burned. If I can interpret various reports properly, and by inspection conclude on the eradication of wild morning glory, white-top and knapweed, a kill of 50 to 80 percent has been accomplished, especially when land was reasonably dry throughout the season. On Canada thistle we think, in most cases, an almost complete kill has been made.

J. C. Hogenson
Utah State Agricultural College
Logan

WASHINGTON

1936

Kittitas County Agricultural Agent:

Poison Plants: Tall larkspur, a poison plant causing serious annual losses in range cattle, was treated with atlacide in 1935 on the John Sienea farm on the Umtaneum. Spring observations showed about 10 percent of the plants killed but the others making a thrifty growth. One plot was heavily dusted with sodium chlorate on this visit. In May a second observation showed nearly all plants killed except those which had been standing in water. These were redusted in May and two additional plots treated -- one burned off with a Hawk firegun and the other treated with kerosene from an ordinary spout can, being sure that the oil ran down into the crowns. The remainder of the patch was sprayed with atlacide -- 2 pounds per gallon of water -- using a total of 70 pounds. A heavy rain fell and caused considerable run-off after the spraying. In June, examination showed about 75 percent of the roots completely rotted, but some still healthy from the crown down. Most of those still covered with water were dead and rotted above

Washington-1936 (Continued)

and below the crown but showed live tissue and bud development in the crown itself. Results on the burned plot were not satisfactory but on the kerosene plot all plants treated were dead and decaying -- root material still smelled strongly of kerosene.

W. O. Passmore
Ellensburg

WYOMING

1932

Poison Plants: Professor O. A. Beath, station chemist, spent June 6 and 7 in the county. On June 6, we visited the Earnest Lynde ranch on S. A. Creek, north of Recluse. Mr. Lynde has been losing from five to twenty head of cattle each season for the past 10 years, in one pasture. We made a careful survey of the pasture, finding Hayden's Vetch, surrelia, camas, larkspur and loco. Hayden's Vetch was the only poisonous plant found in sufficient quantity to cause losses. This plant is quite selective in its location; so, therefore, it was found growing in well defined areas on the adobe or gumbo hillsides. Prof. Beath recommended that the best method of eradication was to grub out the plants. Death losses could be avoided by supplying the cattle plenty of salt at all times and pasturing such areas early in the season or withholding such pastures for winter grazing.

On June 7, we made a trip through the southern part of the county, observing the range for poisonous plants as we traveled. Large areas of woody aster were noted in the Belle Fourche River district. Of course, Death Camas was ever present. Hayden's Vetch was also found here and there, throughout the entire area. We visited the B. J. Reno sheep range where they had suffered a severe loss of sheep two years ago when moving a band of yearlings into the shearing pens. The only poisonous plant that could be found there in sufficient quantity to cause losses was Hayden's Vetch.

Since Professor Beath was here, Mr. Charles Offutt, cattleman of the Little Powder River section, brought in some Hayden's Vetch and reported that he had lost several cattle and wondered if that plant was the cause of his losses. He stated that he had always had this plant in his pasture and up until this year he had had no losses. He was advised to move his cattle out of that pasture and give them all the salt they wanted. After their craving for salt was satisfied, he put them back in the Vetch-infested pasture and suffered no further losses.

In January, S. O. Sherman of Lawver called my attention to a gray-green moss or lichen which they suspected was the cause of complete paralysis and, in some cases, death of cattle. Shortly after that, similar cases were reported by several men. A quantity of the moss was sent to Prof. Beath for analysis. His report was that this moss had been under suspicion several years ago in the Casper section, but due to a slip up in laboratory technique they hadn't been able to confirm their suspicions. However, last winter they got very satisfactory results in the laboratory and definitely established the fact that this moss was causing the troubles reported by our cattlemen. We found that by giving the cattle a partial feed of hay and cotton cake before they went out to graze in the morning, practically all the trouble was

avoided. We also found that a good, stiff dose of Epsom salts (1 pound) and 3 ounces of sweet spirits of nitre, was a satisfactory treatment for cattle affected with the temporary paralysis.

We also found that thorough massaging was helpful in hastening recovery. No doubt, raw linseed oil could be substituted for the Epsom salts, with satisfactory results.

1933

Animal Husbandry Specialist:

Poison Plants: A cattleman in Big Horn County lost 21 head of cows and yearlings within two days' time. This loss occurred about May 20.

Happening to be in Basin at this time, the livestock specialist, together with the county agent, went out to look over the situation. These cattle all died in an area not greater than 20 or 30 acres. A dry bed of Shell Creek practically surrounded the area. In this old creek bed cockleburs were coming up by the millions. At the time we saw them they were just past the two-leaf stage. Without a question of doubt, these cattle had been killed by the new growth of cockleburs in that creek bed. A chemical examination failed to show any signs of other poisons.

J. R. Neale
College of Agriculture
University of Wyoming
Laramie

1934

Niobrara County Agricultural Agent:

Poisonous Plants: In June, livestock losses were reported on the divide between Cotton Wood and Indian Creeks. The Assistant State Veterinarian and the county agent investigated this report of losses, and after three days spent there, it was decided that the cause of death losses and sickness in the livestock was due to selenium poisoning. The water in this pasture being low, contained better than 1½ percent of soda and salts, making it so bitter that the livestock practically refused to drink it. In order to get the amount of moisture they needed they were eating a large amount of greasewood and other plants which contain high amounts of selenium. As soon as the trouble was diagnosed, Dr. Goode, assistant State veterinarian, made the recommendation that the men who had cattle in these pastures move them to other territories. Some of the cattle which were sick when the diagnosis was made were moved to new pastures in wagons. Several weeks later most of the cattle seemed to be entirely free from the symptoms of stiffness, blindness, and emaciation.

Edgar A. Reeves
Lusk - Court House

Wyoming, (continued)

1936

Crook County Agricultural Agent:

Livestock Poisoning: Considerable losses were experienced in livestock in all parts of the county. The heaviest losses in cattle were while they were being fed either oat hay or oat straw. John Crago, of Beulah, Wyoming, lost 44 cattle within three hours' time. The cattle had been fed a load of oat hay during the morning. This was the first feeding of oat hay these cattle had had, but he had been feeding the same feed to his horses for some time. A small band of sheep that were fed with the cattle the same day showed no indication of any poisoning. The cattle started dying within four or five hours after they were fed. Since that date, Mr. Crago has lost 22 head from oats grown in this same ground.

Dr. Port, State veterinarian, and Professor Beath, plant pathologist, were summoned, and they made an examination as soon as possible after this occurred. Professor Beath has been running several tests with feed from the ground on which this oats was grown, and has made several trips of inspection to try and determine the exact cause.

Ollie H. Queen lost 26 head from feeding oat straw under very similar circumstances.

Nat Griffis and George Richards had a loss of 12 head. All these losses occurred within a short time of each other and the cattle showed the same symptoms upon examination.

Other losses were experienced among sheep, which was probably due in most cases to Selium-bearing plants that grow on some of the shales in parts of the county. Examinations made on the ranch of Ray Edsall and Blake Brothers showed that there were these kind of shales present and also the plants that are most apt to carry this poisoning. The poisoning in these plants this year seems to be more potent than in normal years.

Other losses in livestock occurred in Prussic Acid plants due to the fact that stock were forced, on account of lack of grasses, to eat any kind of plants that were available. A great many losses occurred when the cattle were feeding on choke-cherry bush.

L. G. Landers
Sundance

Rodents, Predatory Animals, Insect Pests

ARIZONA

1932

Coconino County Agent:

Porcupines: This animal became a major project in 1931. Practically all runs in the cutover areas along the Coconini and Tusayan Forest boundaries in the vicinity of Kendrick and the San Francisco peaks have been blocks, inspection showing far better results than were expected, and it is believed that

Arizona-1932 (Continued)

control in record time may be accomplished by careful selection of rest trees, proper placing of blocks, and frequent checking in order to keep sufficient poison in the blocks.

Prairie Dogs: Systematic blocking of treated areas of Coconini County is gradually reclaiming thousands of acres of valuable grazing lands, as well as allowing farmers to realize an ambition to raise a crop without prairie dogs.

C. G. Lueker
Flagstaff

CALIFORNIA

1932

Mendocino County Agricultural Agent:

Predatory Animals: An annual appropriation of $7,000 was made by the County Board of Supervisors to maintain the Federal, State, and county cooperative predatory animal control project. The efficiency of this work has been demonstrated in that practically no losses have been sustained from coyotes during the past year. While the earlier efforts of this service have been chiefly directed against coyotes, attention is being diverted to bear, bob-cats, and mountain lions, which at the present time are responsible for losses of livestock and wild game. Livestock owners report the greatest freedom from depredations by predatory animals since this project was undertaken. Sportsmen report the presence of greater numbers of all classes of wild game, which is attributed to the work.

C. S. Myszko
R. D. Foote
Ukiah, Ct. Hs.

COLORADO

1934

Elbert County Agricultural Agent:

Prairie Dog Control: At the request of a considerable number of farmers and stockmen, a survey of prairie-dog infestation was made in June by circular, with return questionnaire to all farmers of the county. An approximate 85% return was secured on this questionnaire.

A summary of the prairie-dog infestation showed 36,500 acres infested. Contacts were made with local and state relief administrations, and D. D. Green, Leader of Biological Survey, for setting up a project to include the whole county in a prairie-dog campaign. A petition was prepared for county commissioners to F.E.R.A. showing need for this project, and presented by them to the State E.R.A. Director and State Pest Control Committee.

The organization for this project was set up by calling a meeting of those interested in various districts and selecting a county committee, consisting of the county extension agent as county pest control leader, the county

Colorado-1934 (Continued)

F.E.R.A. representative and one county commissioner. Three community organizations for the three major districts of the county were formed by calling a meeting and having each district select three committeemen, one chairman and two other members, for the purpose of carrying out this project. The written project in final form was submitted through the proper channels and was approved early in September. Materials were assembled for the mixing of the poison bait and arrangements completed for a county supervisor and assistance to be rendered through the relief office on the mixing of the poison bait. Arrangements were completed for a mixing plant, storage, and distribution of the poison. As soon as materials were received the county supervisor was secured and supervised daily the work of mixing the poison.

A circular was prepared and sent out to all of those who had replied to the prairie-dog survey, advising that the poison would be available and where and on what dates it could be secured. Arrangements were made and a series of meetings held for those interested in prairie-dog control in each of the nine different communities from October 20 to 30. The freshly mixed poison was taken to these meeting places in amounts to cover the need for each community, each of those attending the meeting was thoroughly instructed as to the methods of poisoning, and the poison was distributed to them. Mimeographed sheets of instructions were included in each sack. Each man who received poison signed a receipt for the amount which he obtained, and agreed (1) to distribute according to directions, (2) to make a report of results on the blank furnished, (3) to assume all responsibility for any malicious poisoning of stock. Distribution of the poison was completed in November.

A summary of the poison distributed, acres of infestation, and so forth, shows 10,000 pounds of poison distributed and used by 164 farmers and ranch owners in covering 36,480 acres with a reported kill of 98%. A very conservative estimate of the value of pasture grass and crops saved by this campaign for the one year is $25,000. Benefit will be resultant from the campaign for the next five years or longer.

Max C. Grandy
Silma

IDAHO

1932

Jefferson County Agricultural Agent:

Rodent Control: Rabbit infestation has been the worst in years. Owing to the short feed on the desert last fall and the excessively deep snows throughout the winter, practically all the rabbits moved into the farms and have remained until spring. Old residents in the territory state that they have never before seen them in such numbers or remained bunched so long. It has not been out of the ordinary to see from 1000 to 2500 rabbits feeding around one hay stack.

In early December, when the extent of the infestation could be determined the Biological Survey stationed a man at Mudlake and for three months he has worked in that vicinity.

Approximately 550 ounces of strychnine have been mixed and distributed through the Mudlake, Hamer, and Roberts districts. Farmers and stockmen were charged just the price of the strychnine in the bait while the county and Biological Survey stood the price of the other ingredients and the labor.

Idaho-1932 (Contined)

In addition, nine to eleven rabbit drives were organized where more than 50,000 rabbits were captured, while several thousand more were killed with guns. It is conservatively estimated that approximately 300,000 rabbits have been killed during the campaign. It is safe to estimate that four-fifths of the rabbits have been exterminated.

D. E. Smith
Rigby

MONTANA

1935

Carter & Fallon Counties Agricultural Agent:

Predatory Animal Control: Early in the fall of 1934, a group of sheepmen on Box Elder in south-central Carter County, held a meeting for the purpose of deciding on some way to control their losses from coyotes. Hight Brothers, airplane pilots of Belle Fourche, were present at the meeting and offered to assist the sheepmen by hunting from airplane for $10 per carcass, giving the sheepmen the pelt, and to furnish their own gasoline providing that the sheepmen would furnish sufficient horses and riders to comb the breaks and coulees and timber to drive out the coyotes where they could spot them and get to them by plane. In a three-day hunt conducted by these sheepmen 33 coyotes were killed, and these Box Elder sheepmen were so enthusiastic over the idea that it was brought up and discussed at the County Wool Growers' Meeting February 16. The Wool Growers' Association heartily endorsed this as a method of control and after considerable correspondence with R. E. Bateman, of the Predatory Animal Control office at Billings, as regards a trapper, the association voted in favor of spending money for airplane hunting rather than using a trapper, assessing the sheepmen in the association 2¢ per head for the purpose of raising sufficient funds to pay the $10 bounty of airplane hunters.

Three of the five districts within the next 15 days carried on a coyote drive, having from 50 to 60 riders strung out over 100-yard distances and combing all the country as they went along. The planes would be perched on a ridge in the area of the riders, and as soon as a coyote was raided the rider would ride in a circle, thus informing the plane that he had located a coyote. Before the coyote could get back under shelter, the plane would be over him and shoot him down. There were 77 coyotes killed in this manner in these drives, and it was due to bad weather only and the start of lambing that the drives were not continued in the other two districts. Furs sold from the 77 coyotes totaled $187.95, and $154 was paid the association through State bounties which were in effect at the time of the hunt, making a total of $1168 collected by the treasurer of the association for the payment of the bounties for coyotes.

At a meeting of the coyote bosses held in June, it was decided that bounty would be paid throughout the summer to any trapper or plane pilot who killed coyotes in any of the five districts providing he turned the carcass over to the Boss of the District. There were 15 or 20 coyotes killed during the summer, but no record has been made of them as yet. A total of 5 planes were used at different times throughout the hunt in the killing of the 77 coyotes.

Montana-1935 (Continued)

Sheepmen within the five districts are loud in their praise of the effectiveness of this method of hunting coyotes.

Keith Sime
Baker

NEVADA

1932

Elko County Agricultural Agent:

Magpie Control: The extremely hard winter of 1931-32 destroyed most of the natural feed for these persistent birds and they became very destructive to the livestock interests. After heavy snows covered the ground in November, great numbers of magpies concentrated around bands of livestock and ranch buildings. They were a constant source of bother to stock as they picked at brands, cuts, eyes, and sores.

Eighty-six different ranchers secured information and free magpie poison from the Farm Bureau office during the winter. Two hundred seventy-five ounces of U. S. Biological Survey poison were used on bacon rind and fresh meat baits. These baits were placed upon posts, in trees and around yards where magpies were troublesome.

Between 700 and 800 baits were placed during the winter. A conservative estimate would be 7,000 magpies killed by poison and in all probability many more than that number were killed.

In June 1932 a drive on magpies nests was conducted by several of the boys in Starr Valley, members of the Starr Valley Rangers 4-H Club. Laurence and Russell Goodale destroyed 575 young magpies and eggs within a radius of two miles on Starr and Boulder Creeks. This gives some idea of the density of the magpie population along the small creeks where they breed.

Mark W. Menke
Elko, Ct. Hs.

1935

Humboldt County Agricultural Agent:

Predatory Animal Control: During a conversation with John Mentaberry, who runs a number of bands of sheep in northern Humboldt County, and who had called at the office to sign an application for a Taylor Grazing permit, he complained that the coyotes had killed 500 of his sheep and lambs valued at $1,500, during the past eight months.

Questioning revealed that Joe Telleria Company, Gabica Brothers, Antonia Redin and Mike Goyhex, who also range sheep in this same district, had suffered proportionate losses, and that the total loss by these few sheepmen amounted to $7,500.

Realizing the seriousness of this condition, if it extended throughout the county, the agent promptly interviewed other sheepmen from sections of the county, and discovered that the condition did exist, that coyotes had already killed sheep and lambs to the value of $31,500 since last fall.

Nevada-1935 (Continued)

The loss of $31,500 already recorded from the slaughter of sheep and lambs by coyotes is 22 times the amount annually appropriated by Humboldt County as its share of the maintenance of the farm bureau office and county agent.

It is the sincere hope and plan of the agent to be able to have the State legislature again revive the cooperative agreement between the U. S. Government and the State of Nevada to re-instate the Biological Survey to systematically control the coyote.

Paul L. Maloney
Winnemucca, Ct. Hs.

OREGON

1934

Lane County Agricultural Agent:

Rodent Control: All of Lane County is in an official Douglas ground squirrel control district and official notice to all persons owning or having dominion over land in Lane County to poison or in other ways exterminate gray digger ground squirrels on their holdings within 30 days from date of first publication of notice was published in six Lane County papers on March 8, 15, and 22. News stories calling attention to the campaign and to the official notice were prepared by the county agent and published in all of the papers of the county on March 8 or 9.

During 1934, nine rodent control supervisors appointed by the county court poisoned gray digger ground squirrels on 71 tracts of land containing a total of 9,451 acres. The county court paid the supervisors for labor and poison barley used in this work and will collect the amounts due from various owners with their taxes. In addition to this work where the expense of poisoning squirrels was charged against land owners, three farmers poisoned squirrels on government land with 30 pounds of poison barley furnished by the U. S. Bureau of Biological Survey through the office of the county agent. In these cases the farmers on land adjoining the government land donated the work required to distribute the poison bait.

A feature of the 1934 squirrel control campaign was a contest for young folks planned by the rodent control project committee and directed by R. C. Kuehner, county club agent. The county agent provided from his rodent control fund $5 for use as cash prizes in this contest. There was great interest in the contest and many rodents of all kinds were killed as a result.

O. S. Fletcher
Eugene

UTAH

1936

Uintah County Agricultural Agent:

Mormon Cricket Control: The cricket control project was started May 12, 1936, on Blue Mountain, east of Vernal, on an infestation of about

Utah-1936 (Continued)

23,040 acres. This was rather late in the year to start as the crickets were in their third and fourth stages of growth.

The first method attempted was that of spraying the crickets with a dry mixture of powdered limestone and arsenic dust. After dusting with this powder for two weeks no results were evident, so this system was abandoned.

The second method used was to place a galvanized sheet iron fence about a foot in advance of a moving body of crickets. The crickets on reaching the fence, turned one way or the other and followed it. At frequent intervals chutes were placed, narrowing up to about a foot in width. At this point a galvanized iron bottom is placed in the bottom of the chute. This bottom ends in a dip which allows the crickets to fall into a pit dug under the end of the chute.

The crickets crawl on the galvanized iron until it steepens and then continue to slide into the pit. The edges of the pit are partly covered with galvanized iron so no crickets can get away. They are easily disposed of in the pit, either by burying or burning.

With only 3/4 mile of fence and 15 pits, over 200 bushels of crickets were killed in about two weeks.

In case the march of crickets is changes to another locality, 20 men can move the fence and prepare new pits in half a day. This method is very efficient at any time the cricket armies are moving.

Russell R. Keetch
Vernal

WYOMING

1936

Sheridan County Agricultural Agent:

Magpies: Last winter during the extreme cold the magpie depredations were extremely serious throughout the county. As a result, in cooperation with Oliver Robinson, representative of the Bureau of Biological Survey, letters were sent to all stockmen in which plans for a magpie trap were given. There were approximately 25 of these traps made.

A campaign was put on by the county to cut down the numbers of magpies, and some 5,000 were brought in at 5¢ per head.

These magpie traps were found to be very effective when properly taken care of andproperly baited. It is necessary, however, to move these traps from time to time as the magpies get more or less used to them, and the moving seems to make them more attractive.

There has been some criticism by some organizations as to whether or not the magpies actually do much damage. The stockmen, however, are of the unanimous opinion that in cold weather when everything else is frozen up, the magpies feed on calves and new-born lambs and do considerable annoying to all stock in general.

The trap has been recommended in the place of poison, because it is safe and poison is never safe. For that reason it is gaining more in favor with the stockmen than is the use of poison bait.

E. A. Reeves
Sheridan, Ct. Hs.

Extension Service Circular 281 January 1938

Summary of Range-Livestock and Range-Management Extension Work in the Eleven Western States 1932 to 1936, Inclusive

Part II, Sections 1 and 2

This circular is stapled in three separate sections as follows:

(1) *Part I, Section 1.*
(2) *Part I, Sections 2 and 3.*
(3) *Part II, Sections 1 and 2.*

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